

## A New Species of the Genus *Carex* (Cyperaceae) from Yakushima Island, Japan

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A new species, *Carex* (sect. *Ferrugineae*) *mochomuensis* Katsuy., is here described. This species has been confused with *C. warburgiana* Kük. and *C. shimadae* Hayata from Taiwan, and also resembles *C. tenuior* T. Koyama & Chuang from the Ryukyus, in having long staminate spikes as well as strongly multi-veined and densely hispid perigynia. However, this new species is easily distinguished from those three species by flowering in autumn and having staminate scales with broadly scarious margins. *Carex mochomuensis* is endemic to Yakushima Island.

**Key words:** *Carex*, Cyperaceae, new species, taxonomy, Yakushima Island.

Recently I found that the ‘*Carex warburgiana*’ of Yakushima Island Japan flowered in Autumn, while *Carex warburgiana* Kük. of Taiwan does so in Spring. I recognized it as a new taxon and gave it a Japanese name ‘Akizaki-bakeisuge’ in my monographic book on Japanese sedges (Katsuyama 2005). This species is formally described here as *Carex mochomuensis* named after Mt. Mochomu-dake in Yakushima Island. This rocky mountain is located in the southern part of Yakushima Island where this species occurs from the foot to summit.

***Carex mochomuensis* Katsuy., sp. nov.**

*Carex warburgiana* auct. non. Kük.: Ohwi in Mem. Coll. Sci. Kyoto Imp. Univ. ser. B, 11: 333 (1936), quoad pl. Ins. Yakushima.

*Carex shimadae* auct. non. Hayata: Akiyama, Carices Far East. reg. As.: 128 (1955), quoad pl. Ins. Yakushima.

*Carex* sp.: Katsuyama, *Carex* Jap.: 282

(2005).

Affinis *Carici warburgianae*, *C. shimadae* et *C. tenuiori*, sed floribus autumnalibus et squamis masculinis margine scariosis diversa.

**TYPE:** JAPAN, Kyushu, Kagoshima Pref., Yakushima Island, Yaku-cho, Haruo, Senpiro-no-taki, alt. 200 m, 16 Nov. 2003, T. Katsuyama s.n. (KPM-NA0129596-holo, Figs. 1–2; KYO, TI-iso).

Perennial evergreen herbs. Rhizome short, stout, densely caespitose. Culms central, slender, stiff, 30–70 cm tall, slightly shorter than leaves, obtusely trigonous, smooth. Leaves basal and cauline; blades flat, 3–5 mm wide, stiff, scabrous on adaxial side and along margins, smooth on abaxial sides; basal sheaths with leaf blades, dark brown, strongly fibrillose. Flowers October to December. Inflorescence racemose, with 3–5 spikes, borne on upper 1/2 of culm, remote, solitary at each node; terminal spike staminate, pedunculate, linear, 6–15 cm

long, 2–3 mm wide; lateral spikes pistillate, rather short pedunculate, peduncles enclosed in sheaths, erect to ascending, linear cylindrical, 2–10 cm long, 3–4 mm wide, rarely with short branch at the base, subdensely many-flowered. Bracts with long sheaths, blades upper setaceous, lower short leafy. Staminate scales narrowly elliptic, 5–9 mm long, acuminate, membranaceous, midrib broadly light green to pale brown, both side brownish, margins broadly scarious, sparsely ciliate. Pistillate scales elliptic, 3–5 mm long, shorter than perigynia, acute to acuminate, short aristate, arista and midrib scabrous, midrib light green, both sides brownish, margins broadly scarious, sparsely ciliate. Perigynia erect, oblong elliptic, compressed trigonous, 5–6 mm long, ca. 1.2 mm wide, herbaceous, multi-veined, densely hispid, base stipitate, stipe, 1–1.5 mm long, rather long beaked, beak 1–1.5 mm long, apex deeply bidentate to bifid. Achenes tightly enveloped, elliptic, obtusely trigonous, 3–4 mm long, ca. 1 mm wide, stipitate, stipe 1–1.5 mm long, apex slightly annulate. Style ca. 1 mm long, base slightly or not thickened; stigmas 3, ca. 3 mm long, rather persistent.

Chromosome number:  $2n = 28$  (Yano et al. 2007, as *C. warburgiana*).

Japanese Name: Akizaki-bakeisuge (Katsuyama 2005).

新和名: アキザキバケイスケ (勝山 2005)

Distribution: Endemic to Yakushima Island, Japan; southern part from Hana-age River to Ohko River, alt. 50–1000 m; rocky slopes and on the rocks along the river.

Other specimens examined: Japan. Kagoshima Pref., Yakushima Island: Yaku-cho, Anbo, Hana-age River, alt. 100–200 m, 22 Apr. 2003, T. Katsuyama & al. s.n. (KPM-NA0129595); *ibid.*, 16 Nov. 2003, T. Katsuyama s.n. (KPM-NA0129594); *ibid.*, cult. in Kanagawa Pref., 4 Nov. 2003, T. Katsuyama s.n. (KPM-NA0129598); Yaku-cho, Haruo, Senpiro-no-taki, alt. 300–400 m, 22 Oct. 1983, J. Murata & al. 15715 (KYO, TI); *ibid.*, 15 Jan. 1986, T. Shimizu 86-15 (KYO); *ibid.*, alt. 250 m, 15 Dec. 1987, Hatusima

43304 (KAG); Yaku-cho, Mt. Mochomu-dake, 13 Nov. 1986, S. Mitani s.n. (KAG, KPM-NA0129601); *ibid.*, alt. 300–400 m, 11 Oct. 1984, T. Shimizu 84-1585 (KYO); Yaku-cho, Ohko-no-taki, alt. 50 m, 16 Nov. 2003, T. Katsuyama s.n. (KPM-NA0129597); Mt. Yae-dake, 23 Aug. 1911, Ochiai s.n. (KYO); Yakushima, 5 Sep. 1926 (TI).

*Carex mochomuensis* has been confused with *C. warburgiana* Kük. (Ohwi 1936, Hatusima 1991, 2004) and *C. shimadae* Hayata (Akiyama 1955) from Taiwan, and also resembles *C. tenuior* T. Koyama & Chuang from the Ryukyus (Koyama 1960), in having long staminate spikes as well as strongly multi-veined and densely hispid perigynia. *Carex mochomuensis* is, however, easily distinguished from these three species by flowering in autumn and having pale brown to brown staminate scales with broadly scarious margins. *Carex warburgiana*, *C. shimadae* and *C. tenuior* come into flowers in spring and their staminate scales are dark brown and lacking scarious margins. *Carex mochomuensis* also differs from the other three species in having very long (6–15 cm) staminate spikes and aristate pistillate scales, but these three species have staminate spikes less than 10 cm long and acuminate pistillate scales without arista. Furthermore *C. mochomuensis* differs from *C. tenuior* in having long perigynia (5–6 mm long) with long beaks, which are 3.5–4.5 mm long with short beaks in the latter one.

Both *C. warburgiana* and *C. shimadae* were described from Taiwan (Kükenthall 1909, Hayata 1911). Ohwi (1936) placed *C. shimadae* as a synonym of *C. warburgiana*, but he subsequently revised them as different species mentioning that *C. warburgiana* was distinguishable from *C. shimadae* by having rather remote spikes and perigynia with an acutely bidentate orifice (Ohwi 1943). Akiyama (1955) followed Ohwi's concept.

Koyama (1960) described *C. tenuior* on the basis of specimens collected in Amami-oshima of the Ryukyus and he also treated *C.*



Fig. 1. Holotype of *Carex mochomuensis* Katsuy. (Japan, Kyushu, Kagoshima Pref., Yakushima Island, Yaku-cho, Haruo, Senpiro-no-taki, alt. 200 m, 16 Nov. 2003, T. Katsuyama s.n., KPM-NA 0129596).



Fig. 2. Scale, perigynium and achene of *Carex mochomuensis* Katsuy. (KPM-NA0129596). A. Staminate scale. B. Pistillate scale. C. Perigynium. D. Achene. Scale = 1 mm.

*warburgiana* and *C. shimadae* as specifically distinct from each other by the characters of perigynia; *C. shimadae* differed from the other two species in having fusiform perigynia, 5–7 mm long, gradually tapering above into a long beak, more than half as long as the body; while *C. warburgiana* and *C. tenuior* had perigynia subabruptly contracted into a short beak, less than 1/3 as long as the body, orifice bidentate. *Carex tenuior* differed from *C. warburgiana* in

having oblanceolate perigynia (ca. 3 mm long, 0.8 mm wide) with linear to subulate beak, while *C. warburgiana* had obovate to oblanceolate perigynia (4.5–5 mm long, 1.2–1.5 mm wide) with conical broad beak. Koyama (1962) treated, however, both *C. warburgiana* and *C. shimadae* as identical with *C. makinoensis* Franch. from Japan, because the length of the beak was quite continuous and the color of scales also varied from deep brown to pale stramineous.



Koyama (1978) and Koyama et al. (2000) followed this treatment.

Ohwi (1936) and Akiyama (1955) separated *C. makinoensis* from *C. warburgiana* and *C. shimadae* by having obscurely veined perigynia, instead of the strongly multi-veined perigynia of the latter two species. *Carex makinoensis* also differs from the latter two in having sparsely puberulent perigynia, instead of densely hispid perigynia of the latter two. Therefore I do not adopt Koyama's treatment of 1962, and consider that *C. makinoensis* is a distinct species endemic to the Japanese mainland and there are three species, *C. warburgiana*, *C. shimadae* and *C. tenuior* in Taiwan and the Ryukyus. *Carex mochomuensis* is more similar to the latter three species than *C. makinoensis*, in having strongly multi-veined and densely hispid perigynia.

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#### 勝山輝男：屋久島産スゲ属（カヤツリグサ科）の 1 新種

屋久島産スゲ属植物の1新種アキザキバケイスゲ *Carex mochomuensis* Katsuy. を記載した。本種は台湾産のバケイスゲ *C. warburgiana* Kük. およびオオバケイスゲ *C. shimadae* Hayata と混同されていたもので、琉球産のコバケイスゲ *C. tenuior* T. Koyama & Chuang と同植物体の全形が類似し、雄小穂が長く、果胞に太い脈が多数あり、密に毛

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がある点で似ている。しかし、秋に開花することと鱗片が淡褐色で縁が広く薄膜質な点で、これらの3種からは容易に区別することができる。アキザキバケイスゲは屋久島に固有で、花揚川から大川までの島の南側半分に分布し、標高50 m から1000 m の岩の多い斜面や川沿いの岸壁に産する。  
 (神奈川県立生命の星・地球博物館)